

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A hard coating film excellent in adhesion to be formed on a substrate, comprising stacked layers including at least the following layers (1) to (3):

(1) a first layer on the substrate side comprising one or more metals selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table;

(2) a B- and C-containing surface layer; and

(3) a graded composition layer that is formed in a sandwiched manner between the first layer and the surface layer, and has a thickness of 0.05 μm or more, and in which the content of B and C changes continuously or stepwise from the first layer side toward the surface layer side, wherein a bond between one or more elements selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table, and at least any of B, C, and N is contained in the graded composition layer.

Claim 2 (Original): The hard coating film according to claim 1, wherein at least one of layers of a nitride and a carbonitride of one or more metals selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table is further interposed between the first layer and the graded composition layer.

Claim 3 (Canceled).

Claim 4 (Original): The hard coating film according to claim 1, wherein the ratio of C to B in the surface layer is 0.1 to 0.3 on a mole basis.

Claim 5 (Original): The hard coating film according to claim 1, wherein one or more elements selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table, Si, Al, and N are contained in a proportion of 0.02 to 0.5 mol in the surface layer.

Claim 6 (Withdrawn): A method for manufacturing a multilayer type hard coating film excellent in adhesion according to claim 1, comprising: arranging at least one target of one or more metals selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table, or an alloy thereof, and at least one B- and C-containing target in the same vacuum chamber, and thus applying a sputtering process while rotating the substrate, thereby to form the hard coating film on the substrate surface.

Claim 7 (Currently Amended): A hard coating film excellent in adhesion to be formed on a substrate, comprising stacked layers including at least the following layers (1) to (3):

(1) a first layer on the substrate side comprising a layer of a nitride and/or a carbonitride of one or more metals selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table;

(2) a B- and C-containing surface layer; and

(3) a graded composition layer that is formed in a sandwiched manner between the first layer and the surface layer, and has a thickness of 0.05 μm or more, and in which the content of B and C changes continuously or stepwise from the first layer side toward the surface layer side, wherein a bond between one or more elements selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table, and at least any of B, C, and N is contained in the graded composition layer.

Claim 8 (Canceled).

Claim 9 (Original): The hard coating film according to claim 7, wherein the ratio of C to B in the surface layer is 0.1 to 0.3 on a mole basis.

Claim 10 (Original): The hard coating film according to claim 7, wherein one or more elements selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table, Si, Al, and N are contained in a proportion of 0.02 to 0.5 mol in the surface layer.

Claim 11 (Withdrawn): A method for manufacturing a multilayer type hard coating film excellent in adhesion according to claim 7, comprising: arranging at least one target of one or more metals selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table, or an alloy thereof, and at least one B- and C-containing target in the same vacuum chamber, and thus applying a sputtering process while rotating the substrate, thereby to form the hard coating film on the substrate surface.

Claim 12 (Currently Amended): A hard coating film excellent in adhesion, comprising: a cubic boron nitride film as an outermost surface layer; and a B- and N-containing layer, the cubic boron nitride film being stacked in a state of having been nucleated from the B- and N-containing layer, and the B- and N-containing layer having a ratio of N to B of 0.8 to 1 on a mole basis at least in the nucleation portion, and containing one or more elements selected from the group consisting of elements in Groups 4A, 5A, and

6A, and Si in a proportion of 0.02 to 0.1 on a molar ratio basis, wherein the hard coating film contains C in a proportion of 0.2 or less on a mole basis in at least the nucleation portion.

Claim 13 (Original): The hard coating film according to claim 12, wherein a bond between one or more elements selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table, and Si, and at least any of B and N is contained in the B- and N-containing layer.

Claim 14 (Canceled).

Claim 15 (Previously Presented): The hard coating film according to claim 12, formed on a B- and C-containing film formed on a substrate.

Claim 16 (Previously Presented): The hard coating film excellent in adhesion according to claim 15, wherein the B- and C-containing film provided on the substrate comprises stacked layers including at least the following layers (1) to (3):

(1) a first layer on the substrate side comprising one or more metals selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table;

(2) a B- and C-containing surface layer; and

(3) a graded composition layer that is formed in a sandwiched manner between the first layer and the surface layer, and has a thickness of 0.05 μm or more, and in which the content of B and C changes continuously or stepwise from the first layer side toward the surface layer side.

Claim 17 (Previously Presented): The hard coating film excellent in adhesion according to claim 15, wherein the B- and C-containing film provided on the substrate comprises stacked layers including at least the following layers (1) to (3):

(1) a first layer on the substrate side comprising a layer of a nitride and/or a carbonitride of one or more metals selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table;

(2) a B- and C-containing surface layer; and

(3) a graded composition layer that is formed in a sandwiched manner between the first layer and the surface layer, and has a thickness of 0.05 μm or more, and in which the content of B and C changes continuously or stepwise from the first layer side toward the surface layer side.

Claim 18 (Withdrawn): A method for manufacturing a multilayer type hard coating film excellent in adhesion according to claim 12, comprising: arranging at least one target of one or more metals selected from the group consisting of elements in Groups 4A, 5A, and 6A of the periodic table, and Si or an alloy thereof, and at least one B- and C-containing target in the same vacuum chamber, and thus applying a sputtering process, thereby to form the hard coating film on the substrate surface.